About This Manual

This chapter provides a high-level overview of the *JUNOS Internet Softw are Configur ation Guide: VPNs:*

Objectives

This manual provides an overview of the JUNOS Internet software virtual private network (VPN) functions, and describes how to configure VPNs on the router.

This manual documents Release 5.4 of the JUNOS Internet software. To obtain additional information about the JUNOS software—either corrections to information in this manual or information that might have been omitted from this manual—refer to the software release notes.

To obtain the most current version of this manual and the most current version of the software release notes, refer to the product documentation page on the Juniper Networks Web site, which is located at http://www.juniper.net/.

To order printed copies of this manual or to order a documentation CD-ROM, which contains this manual, please contact your sales representative.

Audience

This manual is designed for network administrators who are configuring a Juniper Networks router. It assumes that you have a broad understanding of networks in general, the Internet in particular, networking principles, and network configuration. This manual assumes that you are familiar with one or more of the following Internet routing protocols: Border Gateway Protocol (BGP), Routing Information Protocol (RIP), Intermediate System-to-Intermediate System (IS-IS), Open Shortest Path First (OSPF), Internet Control Message Protocol (ICMP) router discovery, Internet Group Management Protocol (IGMP), Distance Vector Multicast Routing Protocol (DVMRP), Protocol-Independent Multicast (PIM), Multiprotocol Label Switching (MPLS), Resource Reservation Protocol (RSVP), and Simple Network Management Protocol (SNMP).

Document Organization

This manual is divided into several parts. Each part describes a major functional area of the JUNOS software, and the individual chapters within a part describe the software commands of that functional area.

This manual contains the following parts and chapters:

Preface, "About This Manual" (this chapter), provides a brief description of the contents and organization of this manual and describes how to contact customer support.

Part 1, "VPN Overview," provides an overview of Layer 2 and Layer 3 VPNs.

Chapter 1, "VPN Overview," provides common VPN terminology and describes the major differences between Layer 2 and Layer 3 VPNs.

Part 2, "Layer 2 VPNs," describes how to configure the JUNOS software to support Layer 2 VPNs.

Chapter 2, "Layer 2 VPN Overview," provides an overview of Layer 2 VPNs.

Chapter 3, "Layer 2 VPN Configuration Guidelines," describes the minimum and optional configurations for Layer 2 VPNs.

Chapter 4, "Layer 2 VPN Configuration Example," provides a configuration example for a Layer 2 VPN.

Chapter 5, "Summary of Layer 2 VPN Configuration Statements," describes the statements used to configure Layer 2 VPNs.

Part 3, "Layer 3 VPNs," describes how to configure the JUNOS software to support Layer 3 VPNs.

Chapter 6, "Layer 3 VPN Overview," provides an overview of Layer 3 VPNs.

Chapter 7, "Layer 3 VPN Configuration Guidelines," describes the minimum and optional configurations for Layer 3 VPNs.

Chapter 8, "Layer 3 VPN Configuration Troubleshooting Guidelines," provides guidance for troubleshooting Layer 3 VPNs.

Chapter 9, "Layer 3 VPN Configuration Examples," provides configuration examples for Layer 3 VPNs.

Chapter 10, "Layer 3 VPN Internet Access Examples," provides configuration examples that show how to configure Internet access for Layer 3 VPNs.

Chapter 11, "Summary of Layer 3 VPN Configuration Statements," describes the statements used to configure Layer 3 VPNs.

Part 4, "Interprovider and Carrier-of-Carriers VPNs," describes how to configure the JUNOS software to support interprovider and carrier-of-carriers VPNs.

Chapter 12, "Interprovider and Carrier-of-Carriers VPNs Overview," provides an overview of interprovider and carrier-of-carriers VPNs.

Chapter 13, "Interprovider and Carrier-of-Carriers Configuration Guidelines," describes the minimum and optional configurations for interprovider and carrier-of-carriers VPNs.

Chapter 14, "Configuration Examples for Interprovider and Carrier-of-Carriers VPNs," provides examples that show how to configure interprovider and carrier-of-carriers VPNs.

Chapter 15, "Summary of the Interprovider and Carrier-of-Carriers Configuration Statement," describes the statement used to configure interprovider and carrier-of-carriers VPNs.

Part 5, "Layer 2 Circuits," describes how to configure Layer 2 circuits.

Chapter 16, "Layer 2 Virtual Circuits Configuration Guidelines," describes how to configure Layer 2 virtual circuits.

Chapter 17, "Summary of Layer 2 Circuit Configuration Statements," describes the statements used to configure Layer 2 circuits.

This manual also contains a glossary, a complete index, and an index of statements and commands.

Part Organization

The parts in this manual typically contain the following chapters:

Overview—Provides background information about and discusses concepts related to the software component described in that part of the book.

Configuration statements—Lists all the configuration statements available to configure the software component. This list is designed to provide an overview of the configuration statement hierarchy for that software component.

Configuration guidelines—Describes how to configure all the features of the software component. The first section of the configuration guidelines describes the minimum configuration for that component, listing the configuration statements you must include to enable the software component on the router with only the bare minimum functionality. The remaining sections in the configuration guidelines are generally arranged so that the most common features are near the beginning.

Statement summary—A reference that lists all configuration statements alphabetically and explains each statement and all its options. The explanation of each configuration statement consists of the following parts:

Syntax—Describes the full syntax of the configuration statement. For an explanation of how to read the syntax statements, see "Documentation Conventions" on page xxi.

Hierarchy level—Tells where in the configuration statement hierarchy you include the statement.

Description—Describes the function of the configuration statement.

Options—Describes the configuration statement's options, if there are any. For options with numeric values, the allowed range and default value, if any, are listed. For multiple options, if one option is the default, that fact is stated. If a configuration statement is at the top of a hierarchy of options that are other configuration statements, these options are generally explained separately in the statement summary section.

Usage guidelines—Points to the section or sections in the configuration guidelines section that describe how to use the configuration statement.

Required privilege level—Indicates the permissions that the user must have to view or modify the statement in the router configuration. For an explanation of the permissions, see the *JUNOS Internet Software Configur ation Guide: Getting Started*.

See also—Indicates other configuration statements that might provide related or similar functionality.

Using the Indexes

This manual contains two indexes: a complete index, which contains all index entries, and an index that contains only statements and commands.

In the complete index, bold page numbers point to pages in the statement summary chapters. The index entry for each configuration statement always contains at least two entries. The first, with a bold page number on the same line as the statement name, references the statement summary section. The second entry, "usage guidelines," references the section in a configuration guidelines chapter that describes how to use the statement.

Documentation Conventions

General Conventions

This manual uses the following text conventions:

Statements, commands, filenames, directory names, IP addresses, and configuration hierarchy levels are shown in a sans serif font. In the following example, *stub* is a statement name and [edit protocols ospf area *area-id*] is a configuration hierarchy level:

To configure a stub area, include the stub statement at the [edit protocols ospf area *area-id*] hierarchy level:

In examples, text that you type literally is shown in bold. In the following example, you type the word *show*:

[edit protocols ospf area *area-id*]
cli# **show**
stub <default-metric *metric*>

Examples of command output are generally shown in a fixed-width font to preserve the column alignment. For example:

```
> show interfaces terse
Interface       Admin Link Proto Local            Remote
at-1/3/0        up    up
at-1/3/0.0      up    up   inet  1.0.0.1          --> 1.0.0.2
                           iso
fxp0            up    up
fxp0.0          up    up   inet  192.168.5.59/24
```

Conventions for Software Commands and Statements

When describing the JUNOS software, this manual uses the following type and presentation conventions:

Statement or command names that you type literally are shown nonitalicized. In the following example, the statement name is *area*:

You configure all these routers by including the following area statement at the [edit protocols ospf] hierarchy level:

Options, which are variable terms for which you substitute appropriate values, are shown in italics. In the following example, *area-id* is an option. When you type the area statement, you substitute a value for *area-id.*

area *area-id*;

Optional portions of a configuration statement are enclosed in angle brackets. In the following example, the "default-metric *metric*" portion of the statement is optional:

stub <default-metric *metric*>;

For text strings separated by a pipe (|), you must specify either *string1* or *string2*, but you cannot specify both or neither of them. Parentheses are sometimes used to group the strings.

> *string1 | string2*
> (*string1 | string2*)

In the following example, you must specify either broadcast or multicast, but you cannot specify both:

> broadcast | multicast

For some statements, you can specify a set of values. The set must be enclosed in square brackets. For example:

> community *name* members [*community-id*]

The configuration examples in this manual are generally formatted in the way that they appear when you issue a show command. This format includes braces ({ }) and semicolons. When you type configuration statements in the CLI, you do not type the braces and semicolons. However, when you type configuration statements in an ASCII file, you must include the braces and semicolons. For example:

```
[edit]
cli# set routing-options static route default nexthop address retain
[edit]
cli# show
routing-options {
    static {
        route default {
            nexthop address;
            retain;
        }
    }
}
```

Comments in the configuration examples are shown either preceding the lines that the comments apply to, or more often, they appear on the same line. When comments appear on the same line, they are preceded by a pound sign (#) to indicate where the comment starts. In an actual configuration, comments can only precede a line; they cannot be on the same line as a configuration statement. For example:

```
protocols {
    mpls {
        interface (interface-name | all);    # Required to enable MPLS on the interface
    }
    rsvp {                                   # Required for dynamic MPLS only
        interface interface-name;
    }
}
```

The general syntax descriptions provide no indication of the number of times you can specify a statement, option, or keyword. This information is provided in the text of the statement summary.

List of Technical Publications

Table 1 lists the software and hardware books for Juniper Networks routers and describes the contents of each book.

Table 1: Juniper Networks Technical Documentation

Book	Description
JUNOS Internet Software Configuration Guides	
Getting Started	Provides an overview of the JUNOS Internet software and describes how to install and upgrade the software. This manual also describes how to configure system management functions and how to configure the chassis, including user accounts, passwords, and redundancy.
Interfaces and Class of Service	Provides an overview of the interface and class-of-service functions of the JUNOS Internet software and describes how to configure the interfaces on the router.
MPLS Applications	Provides an overview of traffic engineering concepts and describes how to configure traffic engineering protocols.
Multicast	Provides an overview of multicast concepts and describes how to configure multicast routing protocols.
Network Management	Provides an overview of network management concepts and describes how to configure various network management features, such as SNMP, accounting options, and cflowd.
Policy Framework	Provides an overview of policy concepts and describes how to configure routing policy, firewall filters, and forwarding options.
Routing and Routing Protocols	Provides an overview of routing concepts and describes how to configure routing, routing instances, and unicast routing protocols.
VPNs	Provides an overview of Layer 2 and Layer 3 Virtual Private Networks (VPNs), describes how to configure VPNs, and provides configuration examples.
JUNOS Internet Software References	
Operational Mode Command Reference	Describes the JUNOS Internet software operational mode commands you use to monitor and troubleshoot Juniper Networks routers.
System Log Messages Reference	Describes how to access and interpret system log messages generated by JUNOS software modules and provides a reference page for each message.
JUNOScript API Documentation	
JUNOScript API Guide	Describes how to use the JUNOScript API to monitor and configure Juniper Networks routers.
JUNOScript API Reference	Provides a reference page for each tag in the JUNOScript API.
JUNOS Internet Software Comprehensive Index	
Comprehensive Index	Provides a complete index of all JUNOS Internet software books and the *JUNOScript API Guide*.
Hardware Documentation	
Hardware Guide	Describes how to install, maintain, and troubleshoot routers and router components. Each router platform (M5 and M10 routers, M20 router, M40 router, M40e router, M160 router, and T640 routing node) has its own hardware guide.
PIC Guide	Describes the router Physical Interface Cards (PICs). Each router platform has its own PIC guide.

Documentation Feedback

We are always interested in hearing from our customers. Please let us know what you like and do not like about the Juniper Networks documentation, and let us know of any suggestions you have for improving the documentation. Also, let us know if you find any mistakes in the documentation. Send your feedback to tech-doc@juniper.net.

How to Request Support

For technical support, contact Juniper Networks at support@juniper.net, or at 1-888-314-JTAC (within the United States) or 408-745-2121 (from outside the United States).